Space Weather Forecast

Issued on Tuesday, 27 September 2022 at 01:19 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of R1/Minor Radio Blackouts throughout. Chance of G1/Minor geomagnetic storms Day 1 (27 Sep).

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Low with Common-class flares observed. The peak flare came from a large region near south centre disc, which is also close to another relatively large region. Very little growth has occurred in either region, although both are showing some opposite polarity spots giving them a slightly more complex magnetic configuration. The largest region, in terms of area, is in the northeast quadrant but this has a simpler magnetic layout. There are also three further small and simple regions on the disc. No Earth-directed Coronal Mass Ejections (CMEs) have been observed in the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind has been at background speeds although with a recent rise, perhaps indicative of the onset of a coronal hole fast wind but also with some possible weak CME influence. Wind speeds were steady around 300 km/s, but have risen slowly since 26/1900 UTC to reach 360 km/s. The total Interplanetary magnetic field strength was weak for much of the period, increasing after 26/2000 UTC to become strong. The north-south component varied weakly until 26/2100 UTC when it became moderately southward directed. Geomagnetic activity was Quiet (Kp 0 to 2), with an Unsettled (Kp 3) interval after 26/2100 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained just slightly raised above normal background levels, but well below the level of a solar radiation storm.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is forecast to be generally Low, with a chance of isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: Solar winds are currently at background speeds but the speed is rising, likely due to the onset of a coronal hole fast wind combined with some weak CME influence. The connection to the coronal hole is expected to continue through Day 1 and into Day 2 (27-28 Sep), likely easing later Day 2 into Day 3 (29 Sep). Peak wind speeds are likely to be near 500 km/s. Geomagnetic conditions are likely to be Unsettled to Active, with a chance of G1/Minor Storm during Day 1, easing through Day 2. Conditions easing to mainly Quiet Day 3 onwards.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to persist close to background levels, with only a very slight chance of rising towards the radiation storm (S1) level if any notable flares occur, most likely from the larger regions near south centre disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	5	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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